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Subject

Border Highway West Traffic Forecasting Methodology Memorandum

HNTB Job Number

42085

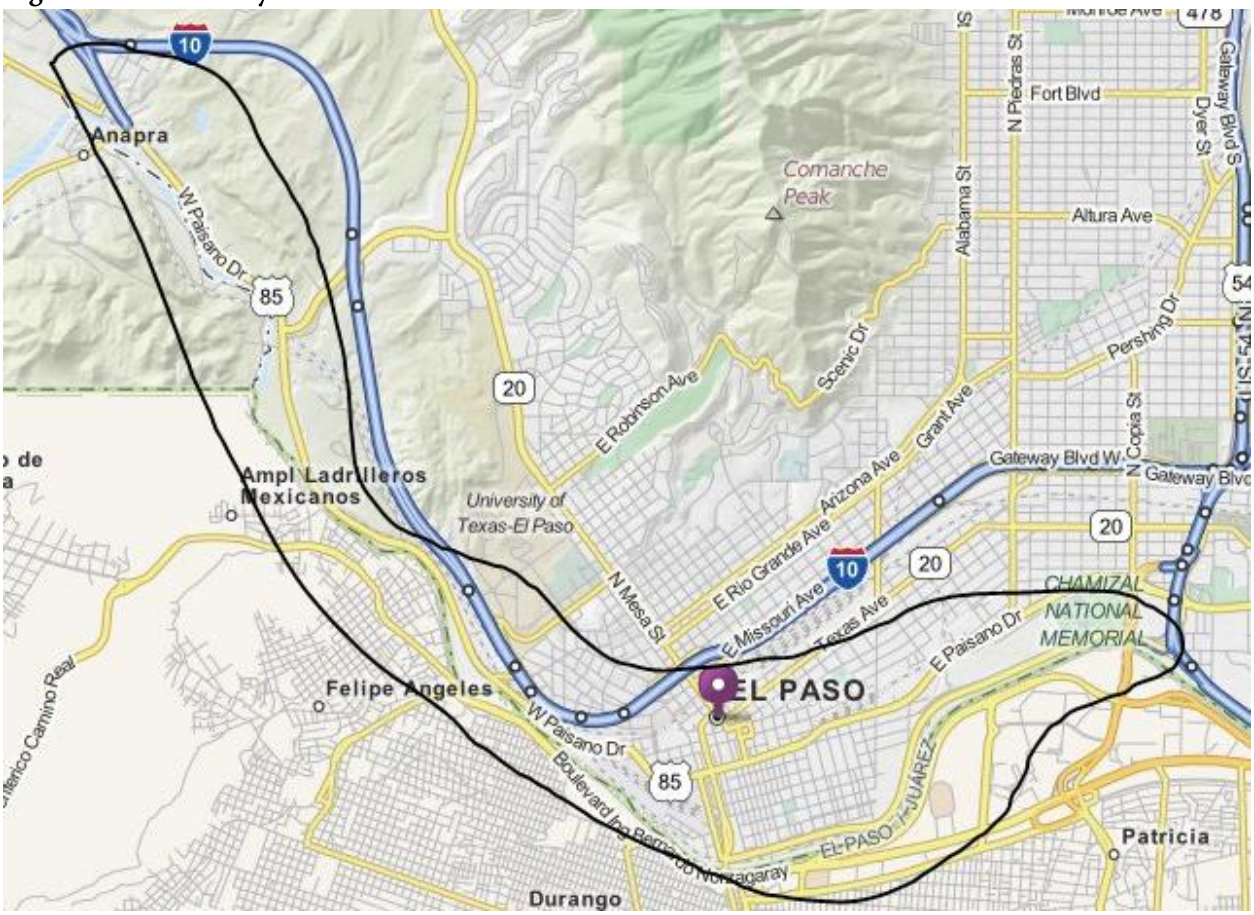
Technical Memorandum

Texas Department of Transportation (TxDOT) has contracted HNTB to conduct traffic forecasting and analysis in support of the environmental analysis for Border Highway West project in El Paso, Texas. The project includes a tolled facility connecting Loop 375 in downtown El Paso to US 85 (Paisano Avenue) just south of I-10. The traffic forecasts for this project also consider on-going planning and environmental study work for the I-10 collector-distributor (CD) project and Spur 1966 and two on-going traffic impact studies within the CD study limits.

This memorandum outlines the process proposed to develop traffic projections for Border Highway West, see Figure 1.

The process includes collecting traffic data, enhancing the Mission Model (TransCAD travel demand model), and developing CALYPSO historic traffic regression projections for surrounding areas to establish future baseline traffic conditions. The scenario traffic projections are developed with the above data, along with two draft traffic impact studies within the study area. The first land development, Desert Pass, is located east of I-10, between Resler Drive and Mesa Street. The second land development, Miner's Village, is located north of Executive Center, between I-10 and Mesa Street. A modification to the existing I-10 interchange with Executive Center is proposed, including a split diamond configuration with a proposed extension of Mesa Park, connecting I-10 and Mesa Street approximately 3400 feet north of the existing Executive Center structure over I-10.

Figure 1: BHW Study Area



Traffic Data Collection

HNTB has requested intersection turning movement data and hourly tube counts be collected at various locations within the study area. This data will be used for three primary purposes:

1. Establish existing traffic operational characteristics, such as freeway densities, intersection delay and level of service.
2. Establish local traffic flow characteristics, such as directionality and temporal distribution along study area corridors.
3. Calibrate the enhanced 2035 Mission Model TransCAD travel demand model (Appendix B) and the VISSIM microsimulation model of the study area.

Travel Characteristics

K-Factor, Directional Splits and Truck Percentages were derived from the Jacobs Traffic Study (2008).
K-factor (30^{th}) = 9.1%; Directional Distribution = 54-46%
Truck Percentages:

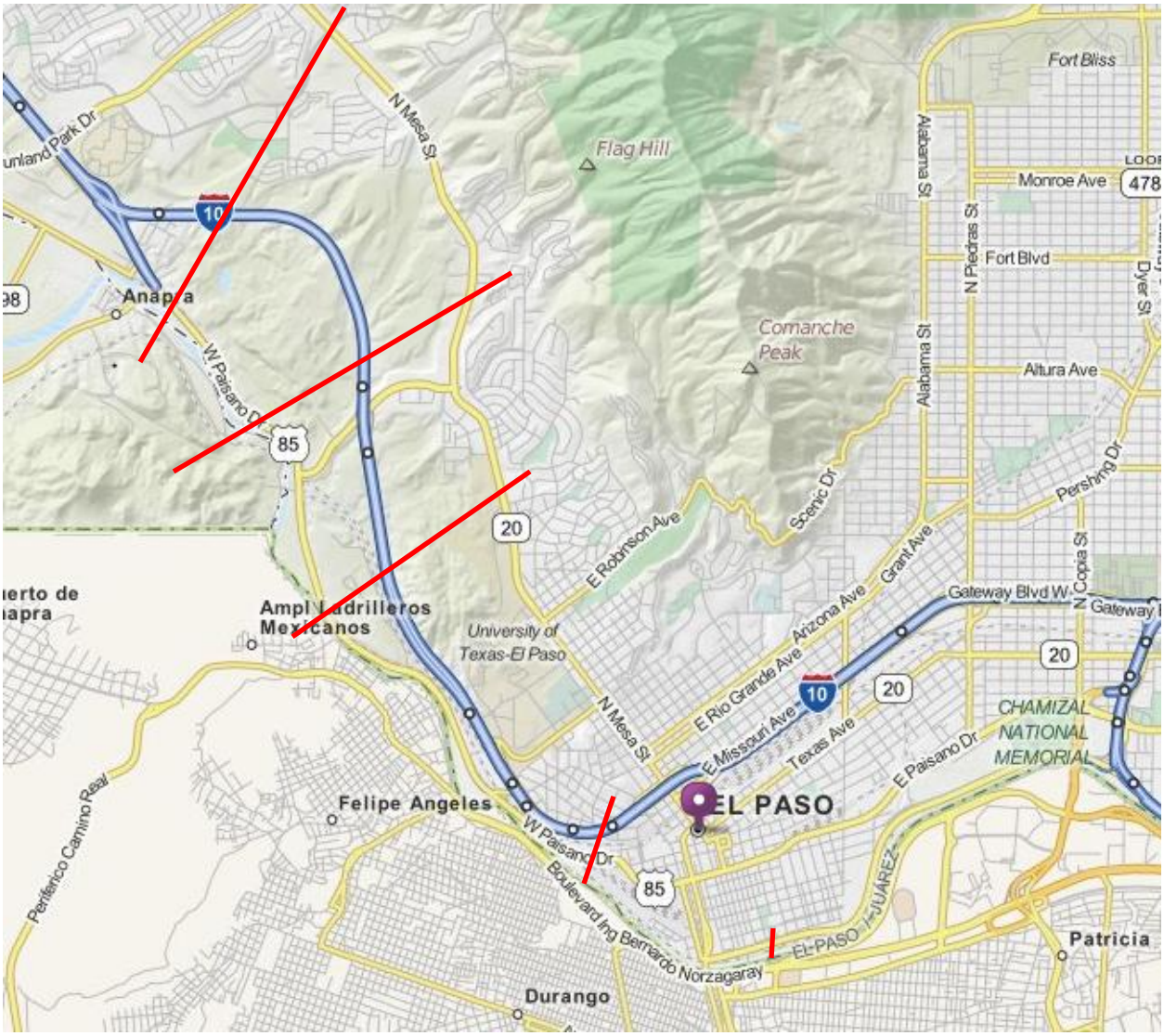
Border Highway West Corridor: 5.00% of ADT, and 3.35% of DHV

I-10 truck data was available from data on the south end of the project. Truck Percentages = 8.0% of ADT. Specific conversion factors are unavailable; therefore, the estimated design hour truck percentage will be established at 5%.

BHW Area Traffic Forecasting

The traffic forecasts developed for the BHW area utilized both the Enhanced Mission Model, as described in Appendix A, and the CALYPSO historical traffic count based estimates, shown in Appendix C across screenlines , shown in Figure 2, established without Border Highway West included.

Figure 2: Screenlines Used in BHW Analysis



For both methods, average growth rates for baseline screenlines were developed. The screen line locations included S. of Doniphan Drive, N. of Executive Center, S. of Executive Center, S. of Spur 1966 and Loop 375 (S. of Downtown) Most of these screenline locations cut across W. Paisano Drive, I-10 and W. Mesa Street. The screenline south of Spur 1966 included W. Paisano Drive, W. Franklin Street and I-10. The Enhanced Mission Model method compares base year 2010 and future year 2015 and 2035 traffic assignments for each segment. An annual growth rate is then calculated. The CALYPSO regression

method also develops an average annual growth rate based on the historical-based projections for the representative roadway segments. Appendix C provides the CALYPSO output.

A recommended annual growth rate of 2.00% was selected as shown in Table 1 and Table 2 respectively.

Table 1: Annual Growth Rate Results, 2010-2015

Enhanced Mission Model (averaged across major screenlines)	CALYPSO (weighted for 3 facilities)	Recommended Growth Rate, 2010-2015
1.61%	2.05%	2.00%

Table 2: Annual Growth Rate Results, 2010-2035

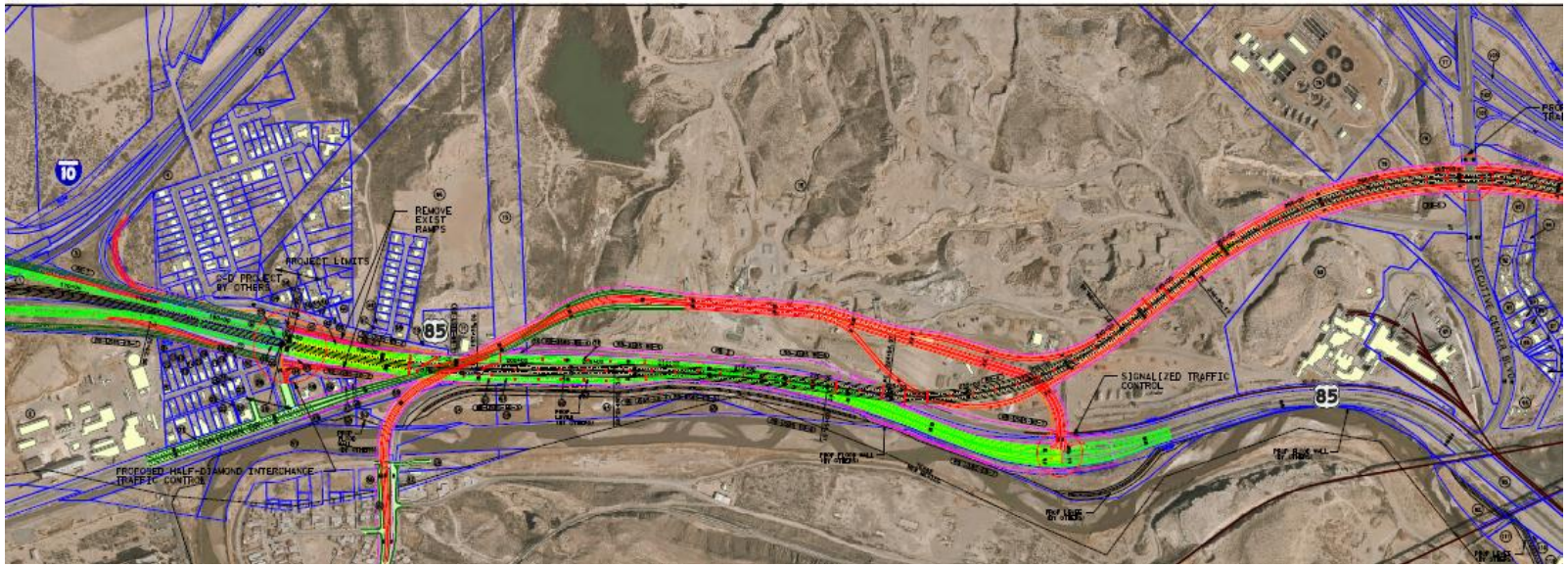
Enhanced Mission Model (averaged across major screenlines)	CALYPSO (weighted for 3 facilities)	Recommended Growth Rate, 2010-2035
1.30%	2.05%	2.00%

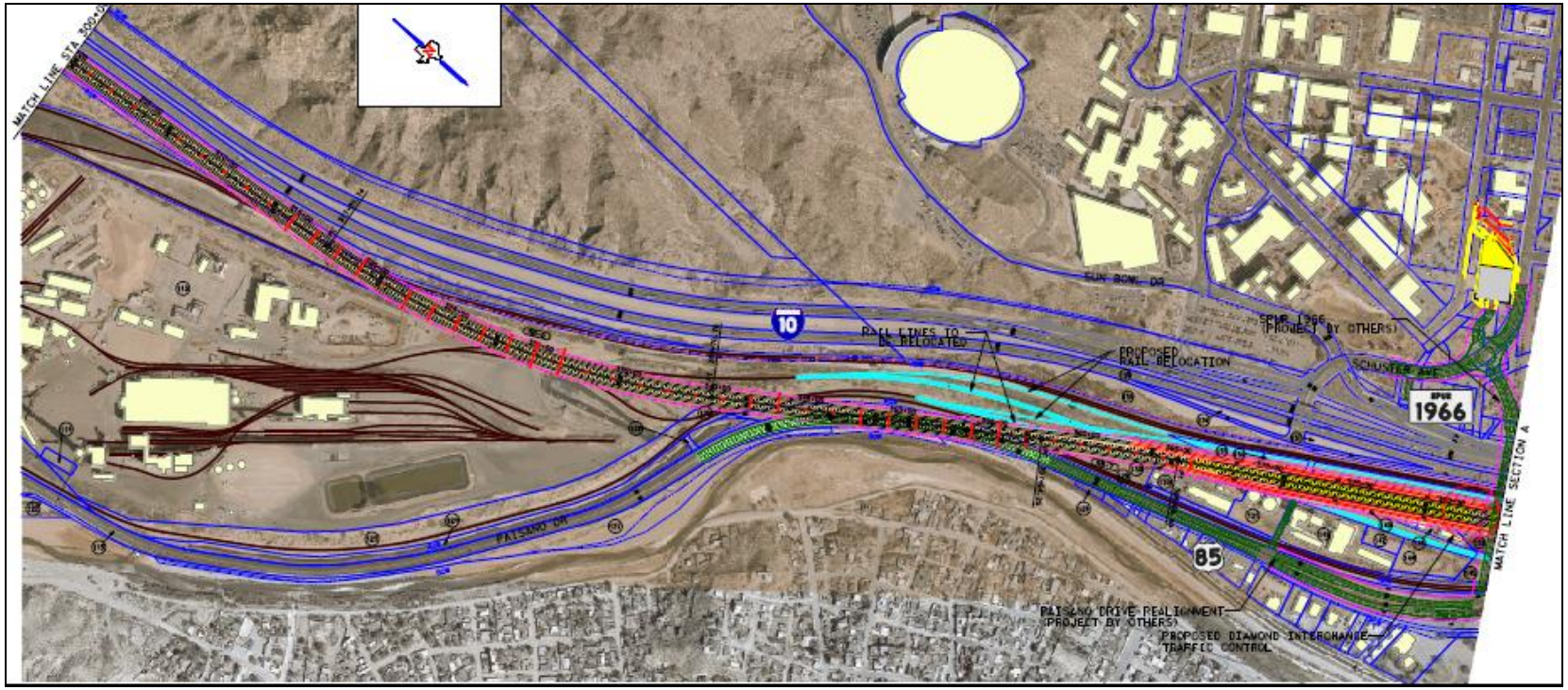
Forecast Assumptions

Several modifications to the existing transportation system have been identified as part of the 2035 design year condition for the BHW project. These items include:

- Inclusion of the Border Highway West (BHW), a tolled facility linking Loop 375 at Santa Fe in downtown El Paso to I-10 immediately south of the CD project limits on US 85. The BHW Border/Rail facility was modeled in the year 2035 Enhanced Mission Model with base toll rates of $0.15 per mile for autos, and $0.45 per mile for trucks. See Figure 3.
- The I-10 CD project includes various direct connections between US 85 and Sunland Park at I-10, along with extending the CD north through Resler Drive ramps to Mesa Street.
- Inclusion of the Desert Pass development between Resler and Mesa Street, east of I-10. The development will have primary access at Resler, but a right-in, right-out on the northbound CD facility is anticipated, see Figure 4.
- The second land development, Miner's Village, is located north of Executive Center, between I-10 and Mesa Street. The existing standard diamond interchange at I-10 and Executive Center will be modified to a split diamond configuration, connecting to the proposed extension of Mesa Park to cross over I-10, as shown in Figures 5 and 6.
- A review of the Enhanced Mission Model's growth in traffic in the area representing the Miner's Village project included approximately 80 percent of the growth predicted by the traffic impact study. Therefore, 20 percent of the additional traffic identified in the traffic impact study has been added to the traffic projections in the CD area.
- The section of I-10 between W. Paisano Drive and Executive Center is assumed to be 4 lanes in each direction as part of the I-10 CD project.
- The area surrounding Sunland Park is nearly fully developed. The Enhanced Mission model showed an annual growth rate of 0.82% on Sunland Park compared with 1.35% along I-10 and surrounding arterials. Therefore, the baseline compounded annual growth rate for Sunland Park is estimated to be 1.12% instead of 2% used for I-10 and surrounding arterials.
- Inclusion of Spur 1966, connecting US 85 with Schuster Avenue near the UTEP campus, which removes the existing Yandell bridge over I-10, and expansion of SunBowl Drive to 4 continuous lanes between Schuster Avenue and Mesa Street.
- Access to and from downtown to/from westbound Loop 375 will include right-out at Mesa and right-in at Campbell with further access at Coles direct connectors to Paisano.
- Inclusion of high-speed ramp connections between I-10 and Loop 375 near US 54/I-110.

Figure 3: BHW Border/Rail Alignment




MATCH LINE STA 900+00
10
RAIL LINES TO BE RELOCATED
PROPOSED RAIL RELOCATION
SCHUSTER AVE
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1966
85
MATCH LINE SECTION A
PROPOSED DIAMOND INTERCHANGE TRAFFIC CONTROL

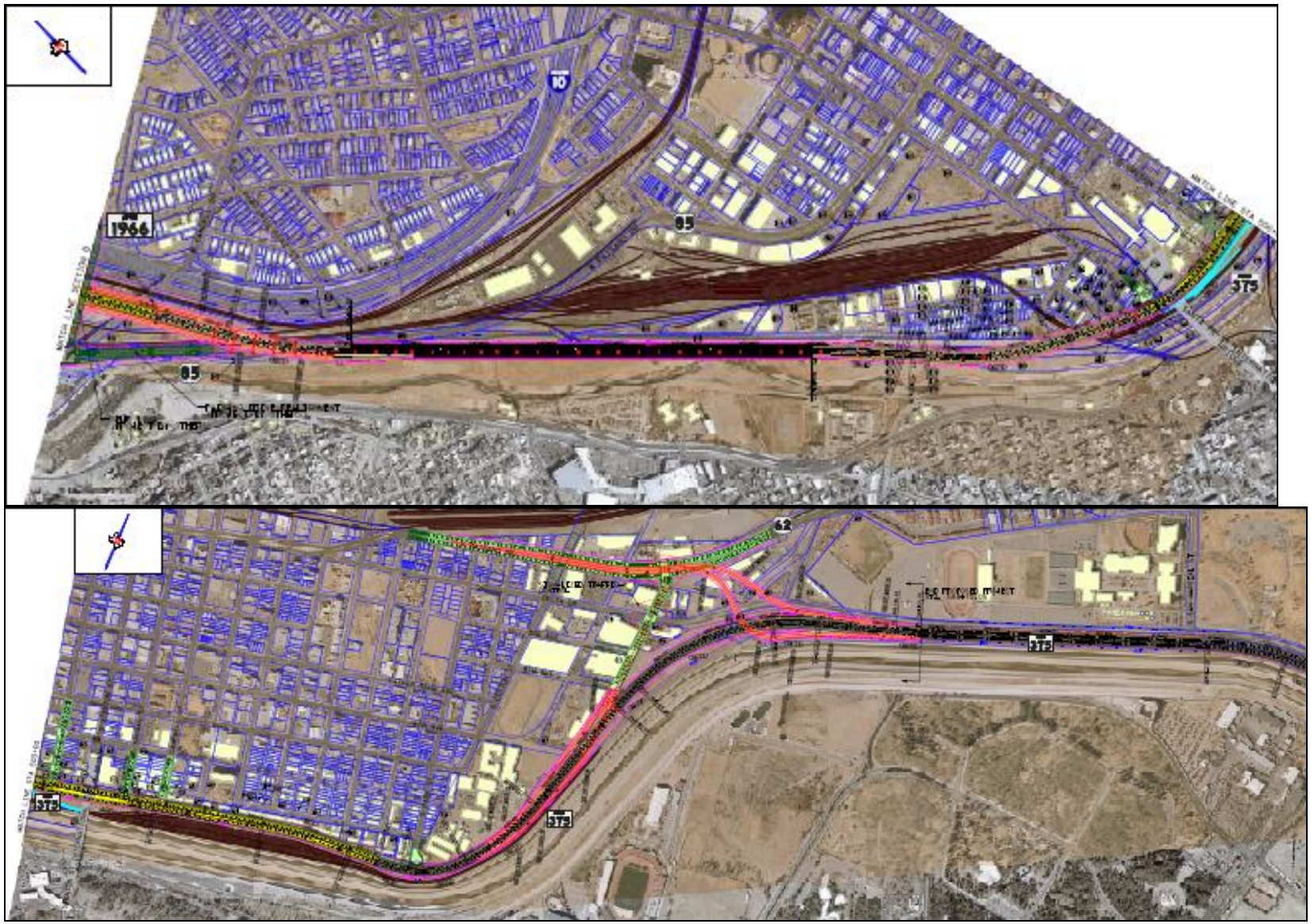

10
1966
85
375
62

Figure 4: Site Layout of Desert Pass Development Near Resler

Figure 5: Proposed Modification of Executive Center Interchange and Site Layout of Miner's Village

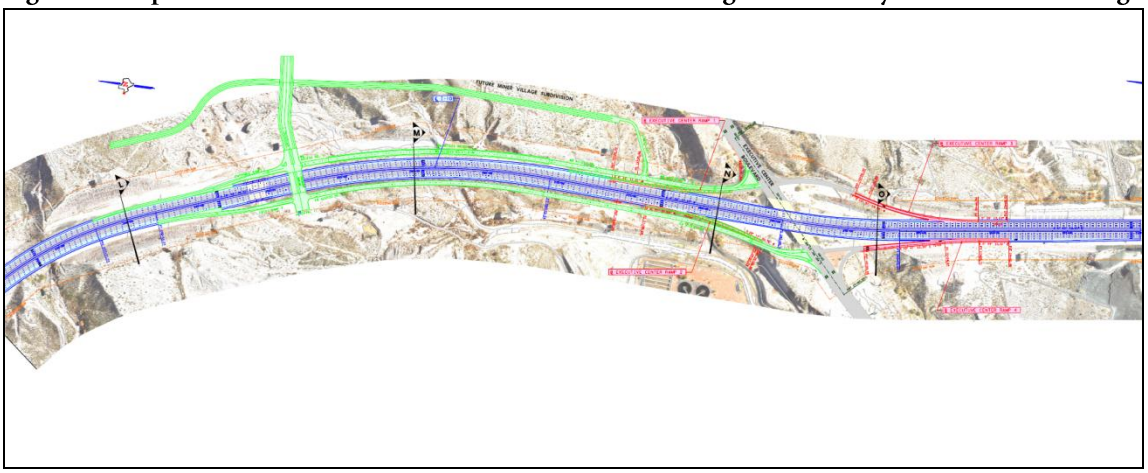
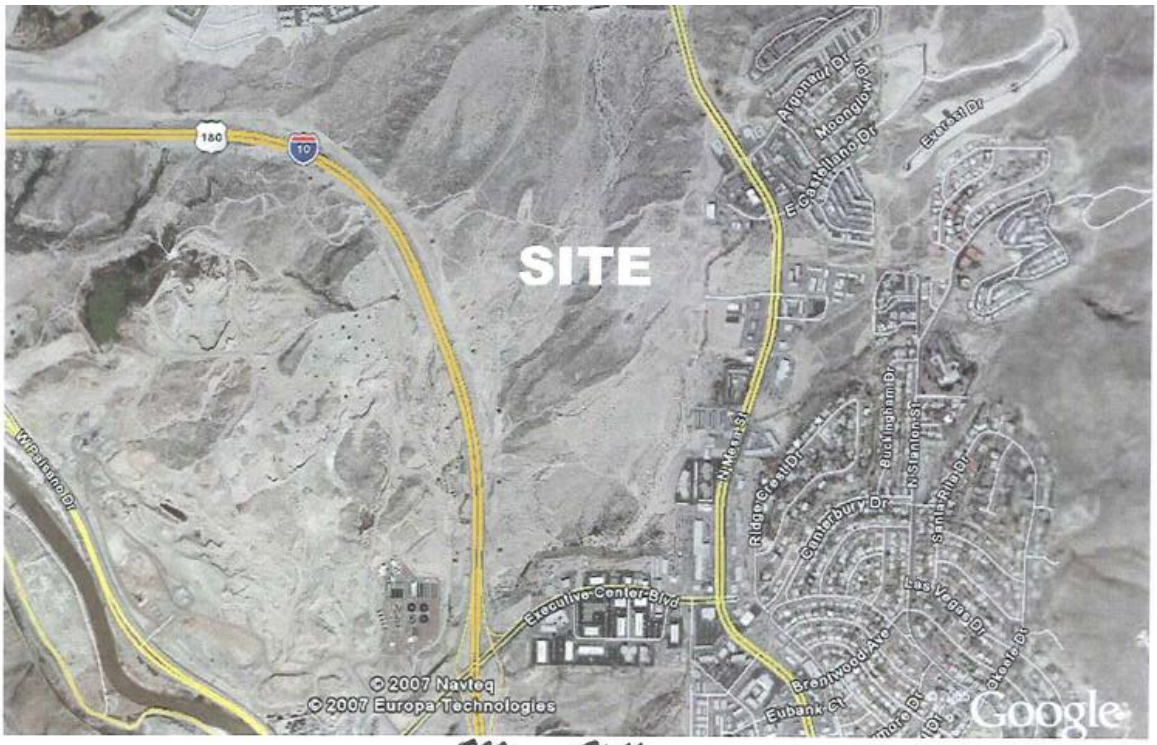


Figure 6: Site for Miner's Village Development



Miner Village
(Executive Center Blvd /Mesa St)
Aerial Photo

Source: Miner's Village Development – El Paso, Traffic Impact Study, June 16, 2008 Draft (Amended)

The BHW project, and the various other projects identified above have been coded into the Enhanced Mission Model and traffic assignments were developed for both 2015 and 2035. Some forecast locations were manually adjusted as needed to ensure consistent and balanced forecasts between scenarios and analysis years. The 2015 and 2035 traffic forecasts for the El Paso BHW project have been updated to reflect TPP's comment for a flat two percent growth rate for the project area. Using the two percent growth rate shown in the line diagrams does not reflect all capacity constraints of I-10, Paisano Drive, and Mesa Street; or toll sensitivity for the BHW. Further analysis will need to be conducted to better estimate toll road usage. The additional traffic volumes predicted by the two traffic impact studies in the project area were added to the forecasts. Table 3 and Table 4 show forecasted traffic volumes by location for 2015 and 2035 respectively. Balanced traffic forecasts are shown in line diagrams in Appendix D, E, and F. Daily turning movements at selected interchanges are shown in Appendix G.

Table 3: 2015 Recommended Build Forecasts

District	Location	baseline 2015 forecast	2015 BHW All Build Tolled
S of Doniphan	BHW and W. Paisano Drive	20,300	22,400
	W. Paisano Drive	20,300	9,300
	BHW (Border/Rail Alignment)	NA	13,100
	McNutt	9,500	9,100
	Doniphan Extension	NA	14,600
	I-10	137,500	129,600
	W Mesa Street	45,400	46,500
N of Executive	W Paisano Drive	34,800	22,800
	BHW (Border/Rail Alignment)	NA	23,300
	I-10	137,500	129,600
	W Mesa Street	43,100	40,700
S of Executive	W Paisano Drive	23,300	21,400
	BHW (Border/Rail Alignment)	NA	10,100
	I-10	144,700	142,000
	W Mesa Street	46,000	43,500
S of Spur 1966	W Paisano Drive	19,000	22,000
	BHW (Border/Rail Alignment)	NA	7,100
	I-10	144,400	143,200
Loop 375	East of Campbell Street	21,700	11,600
	Total on Coles Direct Connectors	NA	31,100
	East of Coles Direct Connectors	22,400	41,400

Table 4: 2035 Recommended Build Forecasts

District	Location	baseline 2035 forecast	2035 BHW All Build Tolled
S of Doniphan	BHW and W. Paisano Drive	31,500	33,200
	W. Paisano Drive	31,500	16,000
	BHW (Border/Rail Alignment)	NA	17,200
	McNutt	14,000	13,500
	Doniphan Extension	NA	21,600
	I-10	206,600	192,300
	W Mesa Street	56,700	58,100
N of Executive	W Paisano Drive	45,500	34,500
	BHW (Border/Rail)	NA	33,200
	I-10	206,600	192,300
	W Mesa Street	64,000	61,000
S of Executive	W Paisano Drive	35,800	30,900
	BHW (Border/Rail Alignment)	NA	23,900
	I-10	215,100	205,200
	W Mesa Street	68,400	64,700
S of Spur 1966	W Paisano Drive	29,400	31,800
	BHW (Border/Rail Alignment)	NA	16,900
	I-10	214,600	206,500
Loop 375	East of Campbell Street	32,300	22,700
	Total on Coles Direct Connectors	NA	42,700
	East of Coles Direct Connectors	33,300	57,000

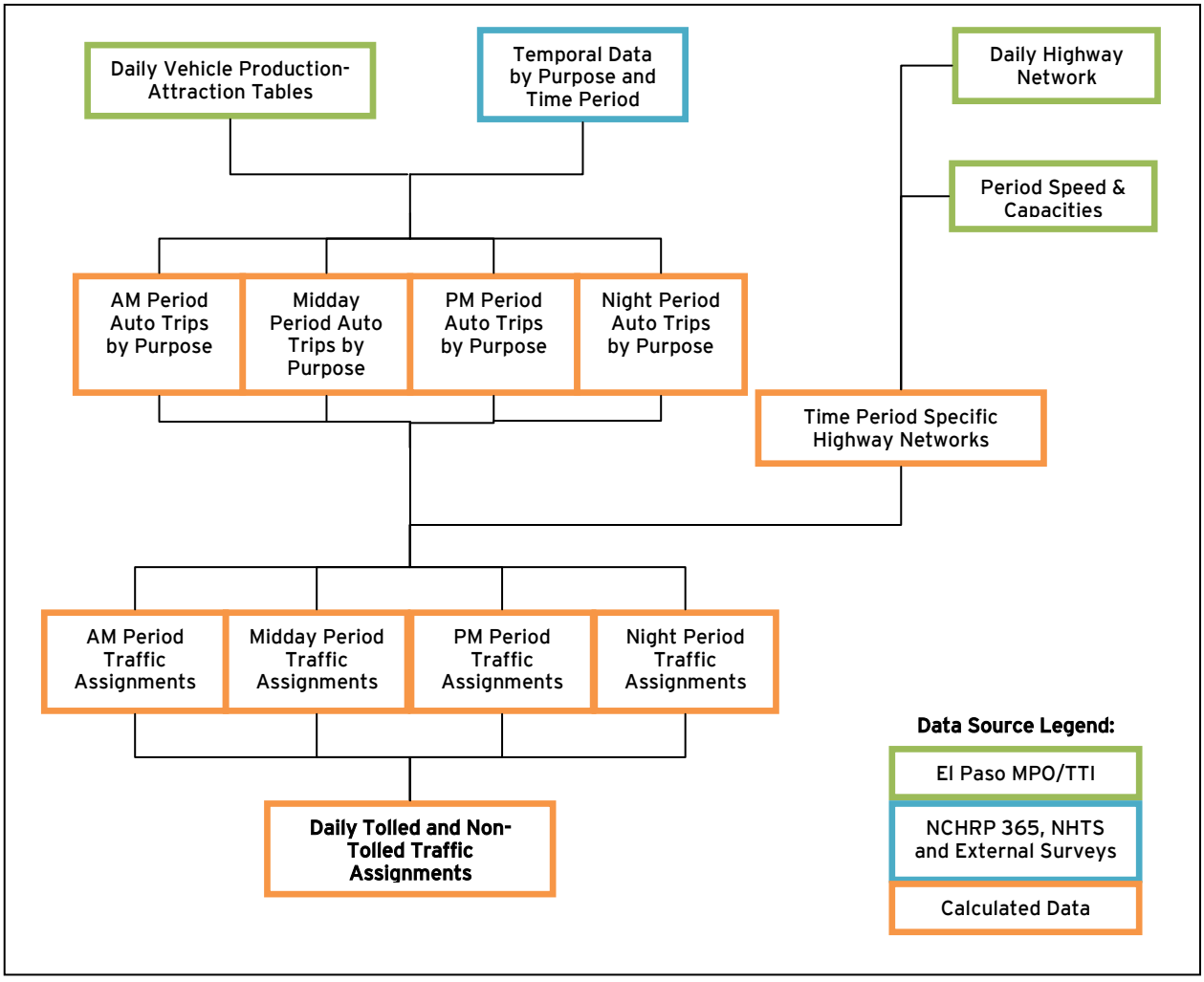
Observations

The traffic estimates for the reconfigured Executive Center split diamond interchange at I-10 will require on-going coordination with the BHW project and the proposed interchange between BHW and Executive Center, currently planned 500 feet west of the I-10 interchange.

Appendix A: Traffic Estimation/TransCAD Analysis

HNTB has utilized available datasets from the approved El Paso Metropolitan Planning Organization (El Paso MPO) Mission Model. The Mission Model is a daily traffic forecasting model developed within the TransCAD travel demand modeling software platform. The Mission Model was developed in conjunction with the El Paso MPO, TxDOT and the Texas Transportation Institute (TTI). The Mission Model is typically provided for corridor analysis in the form of highway networks and daily auto trip tables for years 2010, 2020, 2030 and 2035. Due to the characteristics of the Border Highway West project, additional data from the Mission Model was requested to allow for estimation of travel demand over smaller periods than one twenty-four daily period. Of particular concern is the level of travel demand and resulting roadway congestion during the AM and PM peak periods. Figure 2 provides an overview of the process used to enhance the Mission Model to include four time periods.

Figure 2: Enhanced Mission Model Flowchart



External Trip Classification

Vehicle trips with one or both trip ends outside the El Paso model area are handled within the Mission Model as external trips. There are two types of external trips, those with only one trip end outside of El

Paso (external-internal trips) and those trips with both ends outside of El Paso (external-external trips). The primary facility for external movements is Interstate 10 (I-10). Table 5 and Table 6 show previous data collection for auto and commercial vehicle interaction on I-10 near the El Paso Mission Model limits. Table 7 provides the estimate of external to internal trips at I-10, based on removing the external-external trips from the 24 hour volumes taken at part of the same study.

Table 5: I-10 through movements

From	To	Survey Volume		Percent of Volume	
		Non-commercial	Commercial	Non-Commercial	Commercial
New Mexico State Line	Loop 375	2,311	2,888	44.4%	55.6%
Loop 375	New Mexico State Line	1,914	2,406	44.3%	55.7%
			Average	44.4%	55.6%

Source: Table 9 of El Paso EXTLP2007.PDF, TTI 2007 Memo

Table 6: I-10 24 Hour Volume at I-10

Location	Direction	Volume		Percent of Volume	
		Non-Commercial	Commercial	Non-Commercial	Commercial
New Mexico State Line	NB	23,942	6,728	78.1%	21.9%
	SB	25,608	7,945	76.3%	23.7%
Loop 375	WB	38,216	9,076	80.8%	19.2%
	EB	35,655	11,113	76.2%	23.8%
			Average	77.9%	22.1%

Source: Tables 1 and 2 of El Paso EXLP2007.PDF, TTI 2007 Memo

Table 7: External-Internal Volume at I-10

Location	Direction	Volume		Percent of Volume	
		Non-Commercial	Commercial	Non-Commercial	Commercial
New Mexico State Line	NB	22,028	4,322	83.6%	16.4%
	SB	23,297	5,057	82.2%	17.8%
Loop 375	WB	36,302	6,670	84.5%	15.5%
	EB	33,344	8,225	80.2%	19.8%
			Average	82.6%	17.4%

Source: HNTB Corporation, Table 2 minus Table 1 above.

Table 8 provides the auto and commercial vehicle split for each external station in the El Paso Mission Model. These values were used to disaggregate the external trips into auto and commercial purposes in the Mission Model. All external stations not included in the survey were assumed to have 5% commercial vehicles.

Table 8: Non-Commercial and Commercial Splits for El Paso

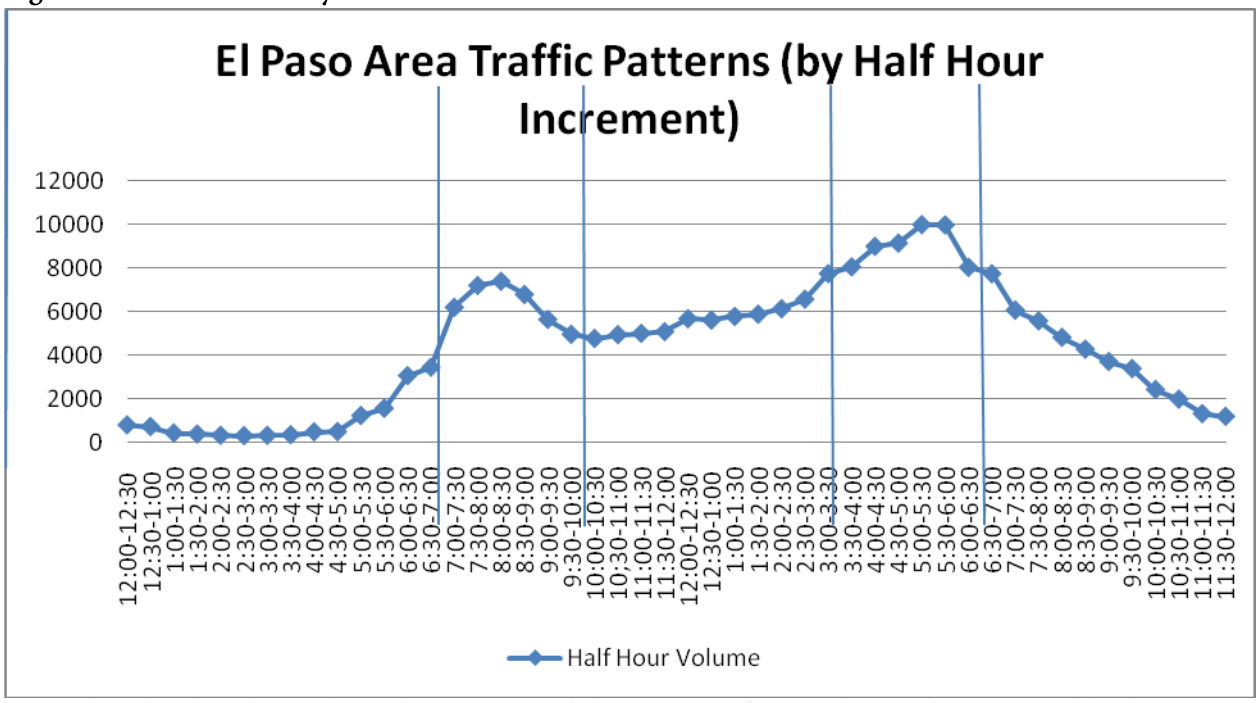
Model Station	Survey Direction	Facility	Non-Commercial Vehicles	Commercial Vehicles
720	Inbound	Cordova Bridge	59,379	2,655
721	Inbound	Stanton Street Bridge	8,467	0
722	Inbound	El Paso Street Bridge	19,454	0
719	Inbound	Zaragosa Bridge	24033	2375
718	Both	Fabens Bridge	2776	0
715	Outbound	US 62/US 180	975	424
716	Outbound	I-10 East	5386	6488
717	Outbound	SH 20 East	489	138
725	Inbound	Santa Teresa POE	1039	301
724	Inbound	Santa Teresa Cattle Crossing	93	12
N/A	Outbound	Hwy 9	282	72
708	Outbound	Hwy 28	1445	199
710	Outbound	Hwy 478	2801	446
711	Outbound	I-10 North	19559	8667
712	Outbound	Hwy 213	1566	201
714	Outbound	US 54	2038	993

Source: Table 20 Expanded Vehicle Survey Results by Station, El Paso External Survey Technical Summary, TTI, August 2003.

Time of Day

Traffic count data in the El Paso area was collected in 2009 and 2010. Figure 3 below shows the daily distribution of traffic per half-hour increment over 20 locations in the El Paso area (concentrated near the Border Highway West study area). This data indicates that the peak three-hour AM period is between 7:00 AM and 10:00 AM, while the peak three-hour PM periods is between 3:30 PM and 6:30 PM. The midday period is therefore five and a half hours long, from 10:00 AM to 3:30 PM. The night period is twelve and a half hours long, from 6:30 PM to 7:00 AM.

Figure 3: Traffic counts by half hour increment in El Paso area



HNTB has developed an enhanced Mission Model, containing four peak period auto trip tables by trip purpose, allowing for traffic assignments to be conducted for each of the four time periods. These four traffic assignments are aggregated to a daily traffic assignment, see Figure 2. Currently, the twenty-four hour trip table is assigned to the highway network, resulting in the daily traffic assignment.

The four peak period trip tables are developed using the vehicle production-attraction tables from the Mission Model's trip distribution model, which have been provided by TxDOT and the El Paso MPO. Temporal data benchmarks comes from two sources, the National Cooperative Highway Research Program Report 365 (Table 9), and National Household Transportation Survey data collected in Wisconsin in year 2001 (Table 10). The temporal factors by trip purpose estimated from these two data sources are shown in Table 11, and have been refined to match observed travel patterns in the Border Highway West study area using peak period traffic counts, hourly tube counts and AADT data. The daily vehicle production to attraction table is first multiplied by the Daily to Peak factor. The P-A to O-D factor is then applied to calculate the number of vehicles trips traveling from the production zone to the attraction zone. The calculation is repeated, but with the transpose of the daily vehicle trip table and with one minus the P-A to O-D factor, resulting in the number of vehicles traveling from the attraction zone to the production zone in the peak period.

Turning movement counts and hourly tube count data were used to estimate a factor to apply to the three hour peak period assignments to derive the AM and PM peak hour estimates. AM peak hour is approximately 43% of the AM period, while the PM peak hour is approximately 37% of the PM period.

Table 9: NCHRP 365 Time of Day Factors

Purpose	Daily to Peak				P-A to O-D			
	AM	MD	PM	NT	AM	MD	PM	NT
HBW	26.32%	13.40%	29.47%	30.80%	0.9490	0.5217	0.1067	0.5030
HBO	15.71%	29.80%	22.61%	31.88%	0.8553	0.5118	0.5380	0.4178
NHB	8.30%	39.66%	29.23%	22.83%	0.5000	0.5000	0.5000	0.5000

Source: National Cooperative Highway Research Program Report 365, Travel Estimation Techniques for Urban Planning, National Academy Press, Washington D.C., 1998, Table 41 (500,000- 1,000,000) and Table 42.

Table 10: NHTS Survey Time of Day Factors, Northeast Wisconsin

Purpose	Daily to Peak				P-A to O-D			
	AM	MD	PM	NT	AM	MD	PM	NT
HBW	33.4%	18.3%	26.9%	21.4%	0.9310	0.4980	0.1260	0.4740
HBSHOP	9.2%	47.6%	26.5%	16.7%	0.7000	0.5060	0.3430	0.3560
HBSCHL	43.0%	21.8%	24.2%	11.0%	0.9420	0.3560	0.1900	0.3450
HBO	15.8%	28.9%	25.1%	30.2%	0.7930	0.5610	0.4630	0.3460
NHB	11.3%	49.5%	24.5%	14.7%	0.5000	0.5000	0.5000	0.5000

Source: National Household Travel Survey Add-On Data, Northeast Wisconsin area, courtesy of the Wisconsin Department of Transportation.

Table 11: Estimated Time of Day Factors, Enhanced Mission Model

Purpose	Daily to Peak				P-A to O-D			
	AM	MD	PM	NT	AM	MD	PM	NT
HBW	32%	15%	29%	24%	0.92	0.45	0.13	0.45
HBNW	21%	30%	27%	22%	0.75	0.50	0.40	0.40
NHB	11%	41%	28%	20%	0.50	0.50	0.50	0.50
Trucks	22%	35%	22%	21%	0.60	0.50	0.40	0.50
Visitor	15%	40%	20%	25%	0.60	0.50	0.40	0.50

Source: HNTB Corporation

Table 12 provides temporal distribution data for the external station movements.

Table 12: Temporal Distribution of Externals

Time Period	Non-Commercial		Commercial	
	In	Out	In	Out
AM	17	18	16	16
MD	28	28	27	29
PM	23	20	18	17
NT	32	34	39	39

Source: Figures 15 and 16 of El Paso External Tech Summary

Network Attribute Modifications

The GISDK TransCAD scripting used to execute the enhanced Mission Model requires the fields described in Table 13 be added to a network. These fields are in addition to the fields used in the standard Mission Model execution.

Table 13: Additional fields required to operate Enhanced Mission Model

Field Name	Description	Range of Values
Exclude	Used to exclude a link from inclusion in the model run. Allows multiple scenarios to be coded into one TransCAD geographic file.	Value of 0 includes the link, other values exclude the link.
Lookup	Used to establish a lookup value to join to the speed/capacity lookup table	FUNCL*10+ATYPE
AB_CAP_AM	AM period capacity in AB direction	
BA_CAP_AM	AM period capacity in BA direction	
AB_CAP_MD	Midday period capacity in AB direction	
…		
BA_CAP_NT	Night period capacity in BA direction	
AB_VOL_AM	AM period assignment in AB direction	
BA_VOL_AM	AM period assignment in BA direction	
AB_VOL_MD	Midday period assignment in AB direction	
…		
BA_VOL_NT	Night period assignment in BA direction	
TOT_VOL_AM	Total two way assignment in AM period	
…		
TOT_VOL_NT	Total two way assignment in night period	
TOT_VOL_24	Sum of two-way volumes for the four time periods	
AM_VOLPERC	Percent of the total daily volume in the AM period	
…		
NT_VOLPERC	Percent of the total daily volume in the night period	
AB_SPD_AM	AM period congested speed in the AB direction	
BA_SPD_AM	AM period congested speed in the BA direction	
…		
BA_SPD_NT	Night period congested speed in the BA direction	
Daily v Period	Ratio of the original daily Mission Model assignment to the enhanced Mission Model assignment	
Tolled	Indicator whether the facility is tolled, and which toll rate to apply	0-4
Toll_auto_am	Toll charged on the link in the AM period for autos	
Toll_truck_am	Toll charged on the link in the AM period for trucks	
…		
Toll_truck_nt	Toll charged on the link the night period for trucks	
Auto_op_cost_am	Auto operating cost per vehicle on the link in dollars for the AM period	
Trk_op_cost_am	Truck operating cost per vehicle on the link in dollars for the AM period	
…		
Trk_op_cost_nt	Truck operating cost per vehicle on the link in dollars for the night period	

Network Lookup Modifications

The speed/capacity lookup table used to develop the daily Mission Model has been modified consistent with the goal of the enhanced Mission Model. The daily Mission Model uses free flow speeds and volume-delay functions that predict average congested speeds throughout the course of 24 hours. This average condition does not accurately reflect the impacts of congestion during the most congested periods of the day, namely the AM and PM peak periods. Therefore, the speeds used in the daily model were altered to more closely represent free flow conditions, with the volume-delay parameters updated to more consistently respond to traffic congestion experienced during the congested peak periods. Appendix C provides the current network lookup table.

Daily capacities were not altered in the enhanced Mission Model. The daily capacities were disaggregated, with each period receiving a portion of the daily capacity. The Mission Model daily capacity for each roadway link are subdivided into the four time periods, as shown in Table 14.

Table 14: Estimated Peak Period Capacity, Enhanced Mission Model

Time Period	Percent of Daily Capacity
AM	16%
Midday	25%
PM	16%
Night	43%

Source: HNTB Corporation

Two new functional classifications have been added to the Mission Model lookup table. Class 15 represents managed lane facilities east of US 54 while class 16 represents managed lane facilities west of I-110. These two new functional classes have been added to provide flexibility in controlling the differences in operational characteristics between the managed lanes and the general purpose lanes within close proximity.

Roadway speeds between the general purpose lanes and the managed lanes dictate the volume of traffic using a managed lane facility. The difference in speed between the managed lane and the general purpose lane must be high enough to offset the cost of using the managed lane before traffic will utilize the facility. The enhanced Mission Model lookup table provides an approximate 10 to 13 mile per hour difference between managed lanes and nearby general purpose lanes. This differential represents the reliability of speeds along the managed lanes. Validation of the speed differentials was conducted using the 2035 Cesar Chavez corridor, see table 11 below.

Base Calibration

A cursory calibration effort has been conducted on the year 2010 daily assignments compared to the original Mission Model. Figure 4 shows the comparison of the Mission Model and the Enhanced Mission Model traffic assignments. The major corridors within the Border Highway West study area have enhanced Mission Model assignments within 5 percent of the original Mission Model assignment.

Enhanced validation was conducted in the Schuster/Yandell area immediately south and east of the University of Texas-El Paso (UTEP) campus. Oregon Street was added from Glory Road/Baltimore Drive to the north and EB I-10 ramps to the south to better represent traffic flow in the area and to relieve Mesa of taking on most of the N-S traffic. Porfirio Diaz was added between Schuster to the north and I-10 ramps to the south and Lawton Street was added from Schuster to the north and to just south of Yandell to also better represent traffic flow between Paisano and the UTEP area. As a result of these additional roadways some of the zone connectors in the area were also moved. shows the addition detail in the Schuster/Yandell area.

Figure 4: Comparison of Mission Model and Enhanced Mission Model Assignments, 2010

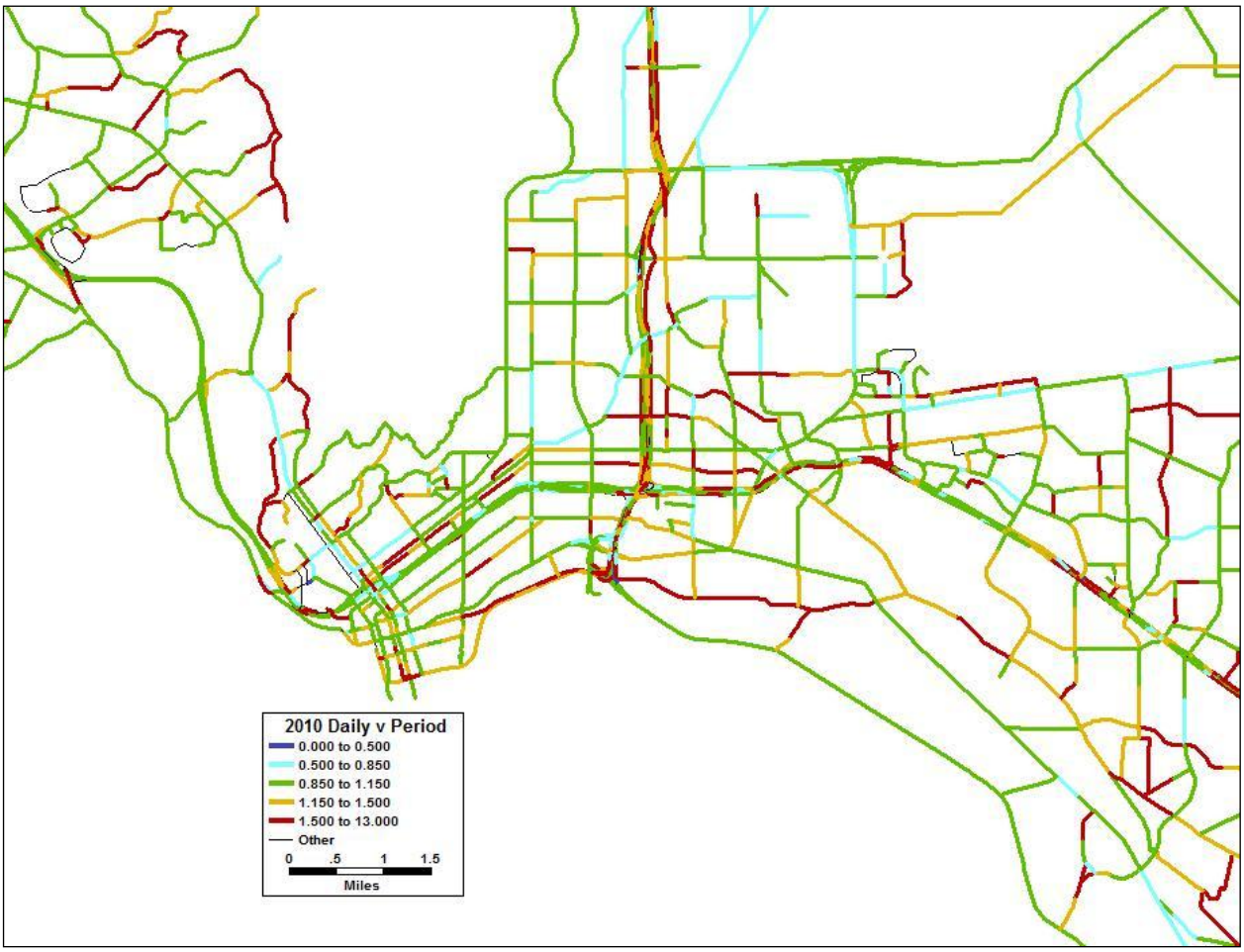
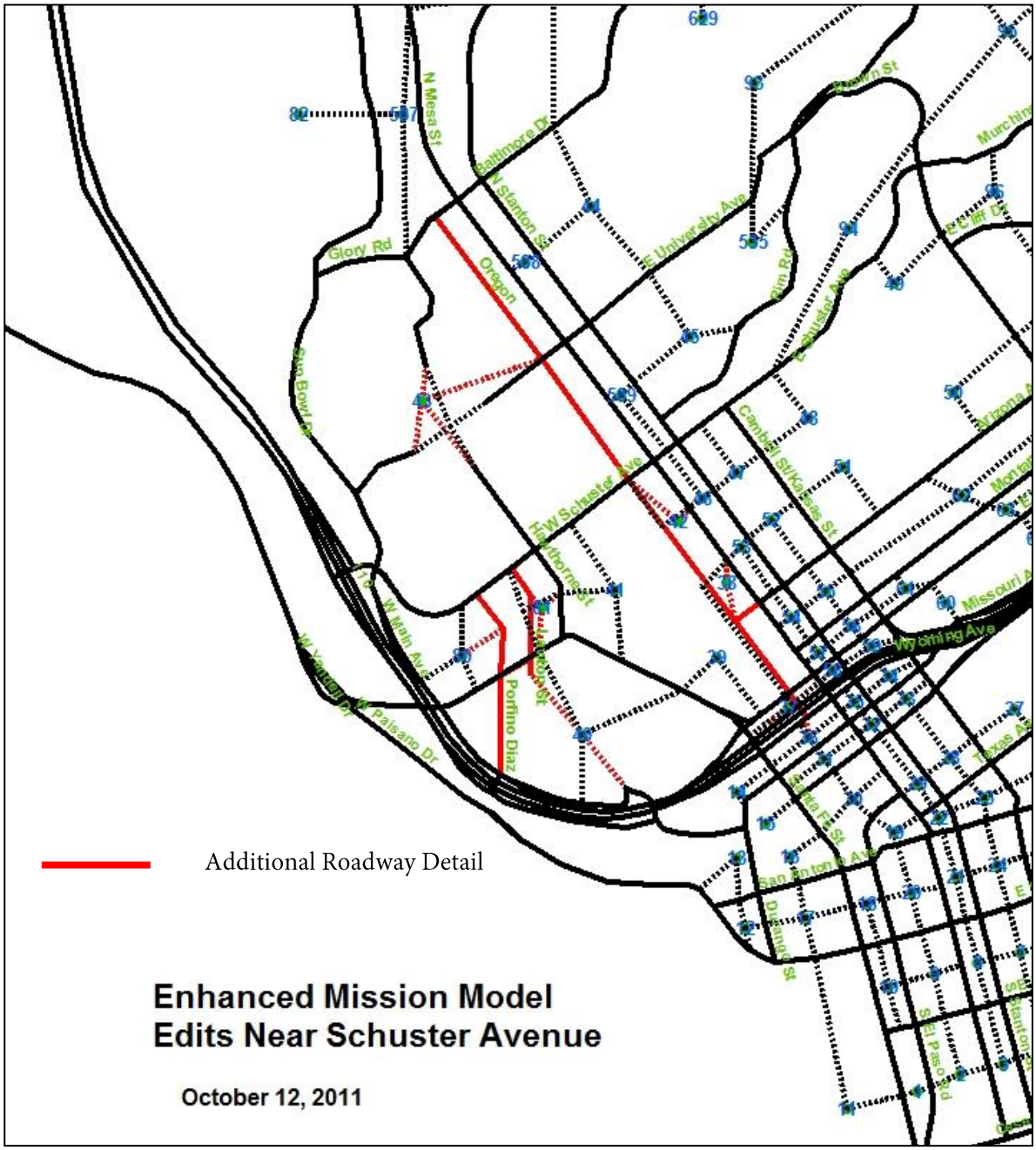


Figure 5: Schuster Area Additional Detail



A calibration effort was also conducted comparing the enhanced Mission Model AM and PM peak period assignments to observed peak period counts. The peak period calibration efforts focused on the Border Highway West study area, using recently collected intersection turning movements and hourly tube count data. HNTB coordinated with El Paso MPO and TxDOT staff during the calibration process. Acceptable calibration of the AM and PM peak periods will consist of the sum of regional model link assignments to be within ten percent of observed traffic volumes for the same link locations for both the AM and PM periods. Further calibration would require modifications to the underlying person trip table, which is beyond the scope of this project.

Table 15: AM and PM Period Validation

Time Period	Observed Period Counts	Period Model Assignments	Percent Difference
AM (7-10 AM)	751,111	755,661	+0.6%
PM (3:30 -6:30 PM)	937,152	926,803	-1.1%

Figure 6 and Figure 7 Comparison of Mission Model and Enhanced Mission Model Assignments, 2035 show the comparison of model assignments for 2020 and 2035. Note that the managed lanes on Cesar Chavez show larger differences due to the peak period congestion impacts on the choice to use the managed lanes versus the general purpose lanes.

Figure 6: Comparison of Mission Model and Enhanced Mission Model Assignments, 2020

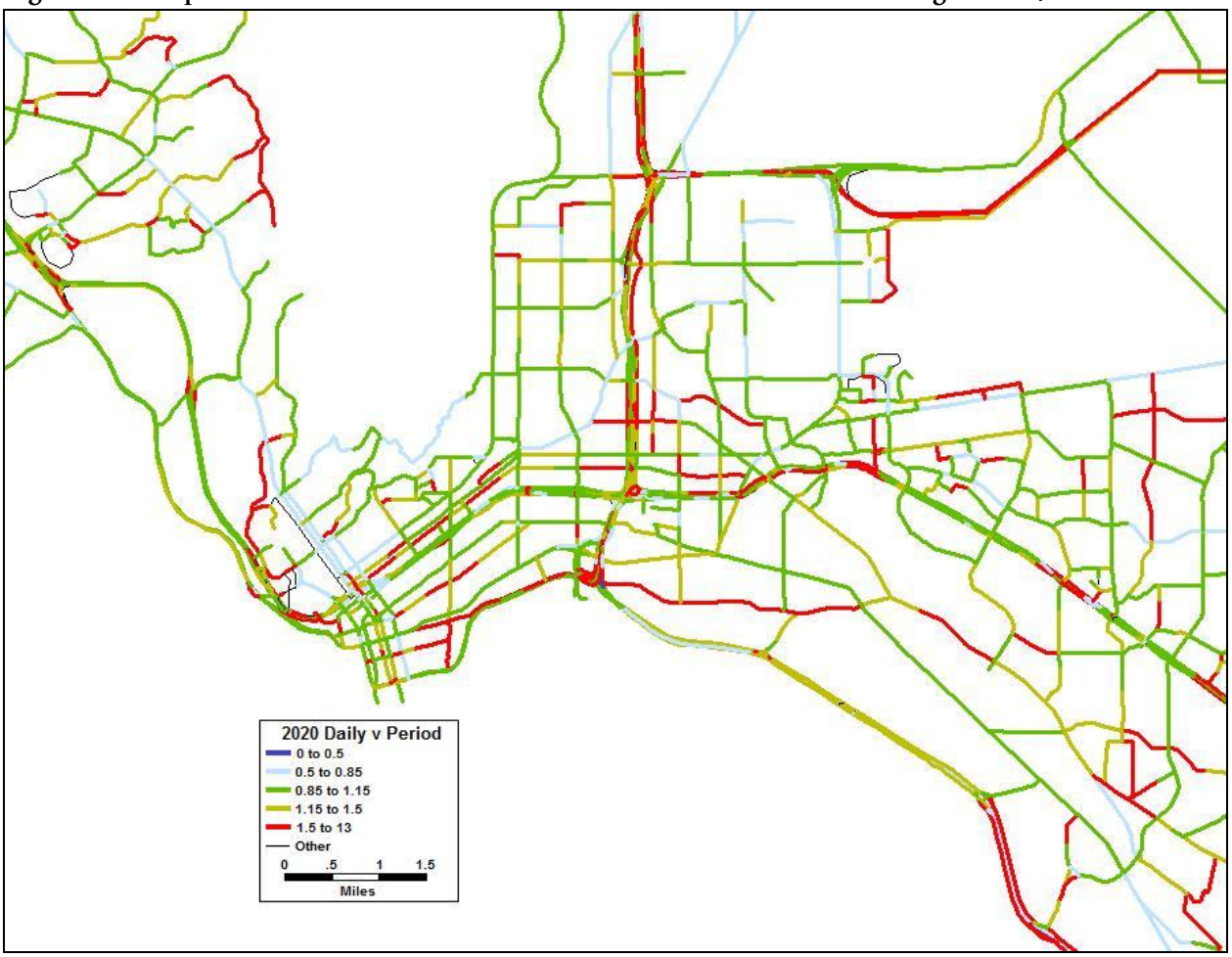


Figure 7 Comparison of Mission Model and Enhanced Mission Model Assignments, 2035

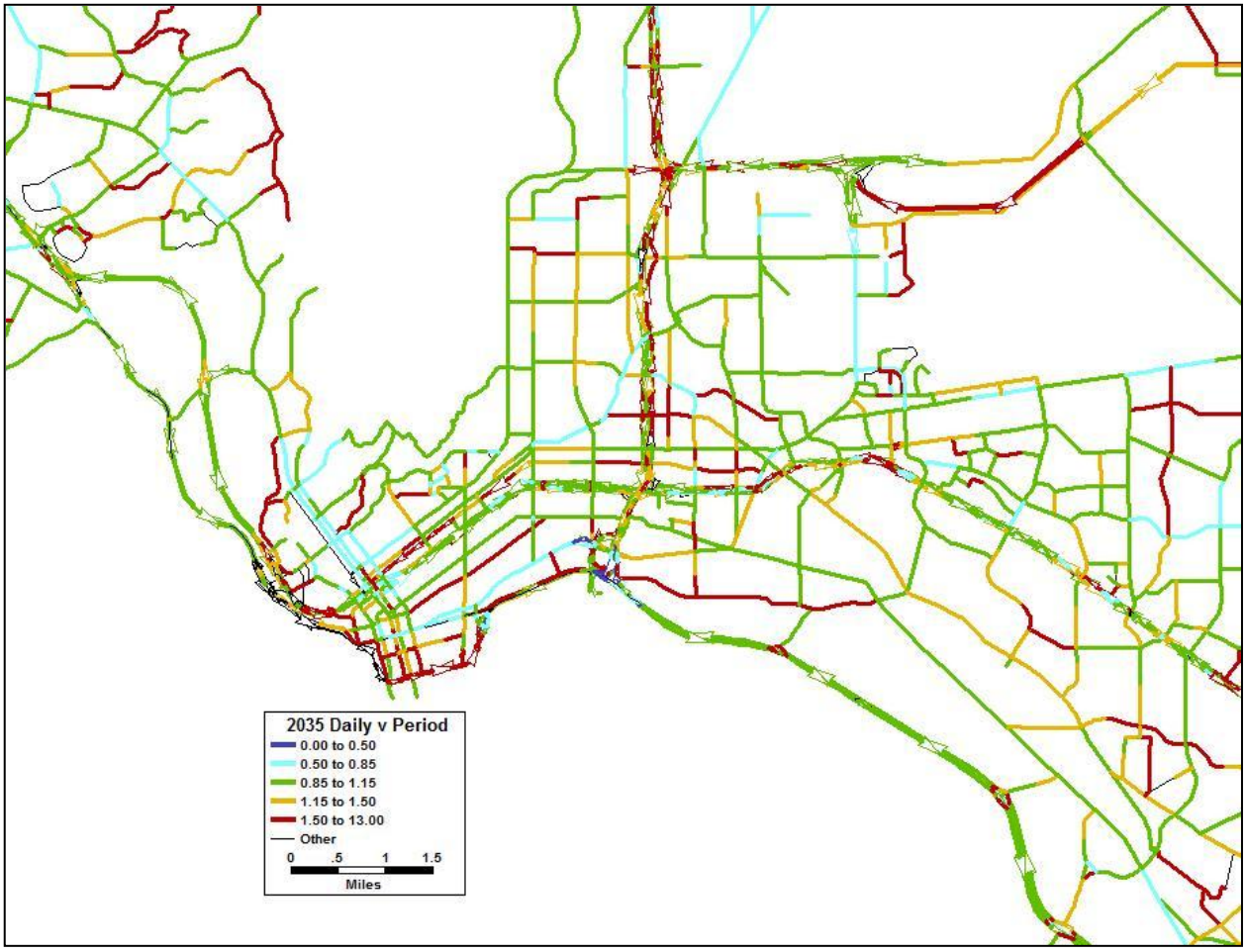


Table 16 provides a comparison of total VMT from the Mission Model and the enhanced Mission Model for years 2010, 2020, and 2035.

Table 16 VMT comparison between original and enhanced Mission Model

Year	Mission Model VMT	Enhanced Mission Model VMT	Percent Difference
2010	15,710,200	16,086,100	+2.39%
2020	18,876,700	19,506,200	+3.34%
2035	21,549,100	22,535,100	+4.58%

Toll Rate

Per the Market Valuation Agreement (MVA) between Camino Real and TxDOT, the 2015 base auto toll rate is $0.10/mile, with trucks having a rate 2 to 5 times the base rate. For modeling purposes, a truck toll rate of 3 times the auto will be utilized, 2015 truck toll rate equals $0.30/mile. The MVA states the base toll rate will be adjusted to maintain LOS C or better on the facility. The MVA also includes a 2%

MINIMUM escalation, or the CPI, whichever is greater. For modeling purposes, a 2% escalation will be utilized. This results in a 2035 base toll rate of $0.15/mile for autos and $0.45/mile for trucks.

Value of Time

Year 2011 demographics report documents the median household incomes shown table 11 in by county in the El Paso area. The corresponding TAZ demographic data provided the number of housing units by county.

Table 11: Median Household Income and Number of Households by County

County	Median Household Income (2009 $)	Households (2010)
El Paso	35,249	256,170
Dona Ana	35,544	12,348
Otero	38,262	3,074

Source: El Paso MPO 2011 Demographic Update Technical Memorandum, Draft, Table 5.

Weighting the median household income by the number of housing units by county results in an area-wide median household income of $35,297 in 2009 dollars. A 2080 hour work year provides an hourly value of $16.97. Using half the hourly wage results in a value of time (VOT) for the El Paso area at $8.49 (2009 dollars).

The MVA indicates a 2% annual escalation for tolling. Using this 2% escalation for VOT results in a $9.56/hour value of time in year 2015 dollars. Trucks are assumed to have three times the VOT, resulting in a $28.68 VOT in 2015 dollars. Using the 2% escalation to year 2035 results in VOT of $14.21 per auto, and $42.62 for trucks.

Vehicle Operating Costs

The price of fuel is relatively volatile, a December quote from El Paso Gas Prices, (http://www.elpasogasprices.com/) is $2.94, therefore a value of $3.00 per gallon will be used. Diesel varied from $3.56 to $3.89, a midpoint value of $3.70 will be used. Using with the 2% escalation rate used in establishing the VOT and toll rates, the 2015 unleaded is $3.25, while diesel is $4.00. 2035 unleaded is $4.83, 2035 diesel is $6.43.

The latest available data for fuel efficiency was for 2008 (http://www.eia.gov/totalenergy/data/monthly/pdf/sec1_17.pdf), which states passenger cars have an average fuel efficiency of 22.6 mpg, while light trucks (minivans, SUV's, etc) have 18.1 mpg average. The vehicle classification data for I-10 east of US 85 indicates a 82%-18% split between passenger cars and light trucks, which would equate to 21.8 mpg. The trend for both vehicle types is slightly improving efficiency, so estimate that 2015 auto fuel efficiency is 22.0 mpg. With $3.25 fuel, the cost per mile for autos in 2015 will be modeled as $0.148/mile.

Truck fuel efficiency is shown at 6.2 mpg in 2008, with an increasing trend. Eestimate truck fuel efficiency for 2015 is 6.5 mpg. With $4.00 diesel, cost per mile for trucks in 2015 will be modeled at $0.615/mile.

Recently proposed NHTSA/EPA fuel economy standards (http://www.nhtsa.gov/staticfiles/rulemaking/pdf/cafe/2017-25_CAFE_NPRM_Factsheet.pdf) indicate that fuel efficiency for autos and light trucks (minivans, SUV's, etc) manufactured in 2025 will be 49.6 mpg. For modeling purposes, it is assumed that turnover in the total vehicle fleet between 2025 and 2035 will result in auto fuel efficiency to be 49.6 mpg in 2035, resulting in $0.097/mile auto operating cost.

According to NHTSA proposals for heavy truck standards for 2015,

"The final NHTSA standards represent an average per-vehicle improvement in fuel consumption of 15 percent for diesel vehicles and 10 percent for gasoline vehicles, compared to a common baseline."

(http://www.epa.gov/otaq/climate/documents/420f11031.pdf)
Using the 15% reduction in fuel consumption from the 2008 data, 2035 truck fuel efficiency is 7.3 mpg. With $6.43/gallon diesel, 2035 truck operating cost is $0.881/mile.

The vehicle operating costs are added to each link as a toll. The actual tolls of the managed lanes are then added on to the vehicle operating costs. This allows for specific costs for autos and trucks separately.

The auto and truck trip tables will be assigned to the time period specific roadway networks for each of the four time periods using TransCAD's multi-modal assignment procedure, which allows for simultaneous assignment of the auto and truck trip tables. The assignment parameters used in the Horizon Model will be utilized to assign each of the four time period trip table sets. The four resulting traffic assignments will be aggregated to generate the daily traffic assignment values for each roadway link.

2010 Validation Check

Total VMT in the original 2010 Mission Model equaled 1.57×10^7, while the enhanced Mission Model parameters resulted in 1.58×10^7, indicating the general traffic assignments were not significantly altered.

2035 Validation Checks

The modifications made to the Enhanced Mission Model are intended to improve the ability to forecast traffic in the El Paso area considering the option of toll facilities. The toll volumes generated for the Cesar Chavez managed lane project are therefore being used as a validation check for the model's modifications. Table 12 compares assignments on the Cesar Chavez general purpose and managed lane facilities between the original Mission Model and the Enhanced Mission Model.

Table 12: Comparison of Original Mission Model and Enhanced Mission Model along Cesar Chavez

Location	Original Mission Model		Enhanced Mission Model	
	Managed Lanes	GP Lanes	Managed Lanes	GP Lanes
West of Fonseca	16,500	47,200	19,100	48,200
East of Fonseca	18,300	47,300	20.100	49,800
South of Midway	13,800	40,200	10,000	43,900
SE of Lee Trevino	12,000	41,400	9,400	43,000
South of Padres	8,400	28,600	4,100	32,900

Appendix B: Network Lookup Table

FUNCL	ATYPE	LOOK UP	SPEED D	CAP PK	A	B	SPEED PK	A PK	B PK	AUTO OPCO35	TRK OPCO35	AUTO VOT35	TRK VOT35
1	1	11.00	38	15200	0.15	4.00	44.00	0.55	7.00	0.0970	0.8810	0.2368	0.7103
1	2	12.00	40	15200	0.15	4.00	44.00	0.55	7.00	0.0970	0.8810	0.2368	0.7103
1	3	13.00	43	15200	0.15	4.00	44.00	0.55	7.00	0.0970	0.8810	0.2368	0.7103
1	4	14.00	46	13300	0.15	4.00	49.00	0.55	7.00	0.0970	0.8810	0.2368	0.7103
1	5	15.00	49	13300	0.15	4.00	51.00	0.55	7.00	0.0970	0.8810	0.2368	0.7103
2	1	21.00	43	28200	0.15	4.00	50.00	0.55	7.00	0.0970	0.8810	0.2368	0.7103
2	2	22.00	45	25100	0.15	4.00	52.00	0.55	7.00	0.0970	0.8810	0.2368	0.7103
2	3	23.00	48	22500	0.15	4.00	55.00	0.55	7.00	0.0970	0.8810	0.2368	0.7103
2	4	24.00	51	20200	0.15	4.00	58.00	0.55	7.00	0.0970	0.8810	0.2368	0.7103
2	5	25.00	54	16700	0.15	4.00	61.00	0.55	7.00	0.0970	0.8810	0.2368	0.7103
3	1	31.00	31	13300	0.15	4.00	37.00	0.30	5.70	0.0970	0.8810	0.2368	0.7103
3	2	32.00	35	11800	0.15	4.00	41.00	0.30	5.70	0.0970	0.8810	0.2368	0.7103
3	3	33.00	39	10400	0.15	4.00	45.00	0.30	5.70	0.0970	0.8810	0.2368	0.7103
3	4	34.00	43	9200	0.15	4.00	49.00	0.30	5.70	0.0970	0.8810	0.2368	0.7103
3	5	35.00	50	7000	0.15	4.00	56.00	0.30	5.70	0.0970	0.8810	0.2368	0.7103
4	1	41.00	30	9400	0.15	4.00	31.00	0.30	5.00	0.0970	0.8810	0.2368	0.7103
4	2	42.00	34	9000	0.15	4.00	35.00	0.30	5.00	0.0970	0.8810	0.2368	0.7103
4	3	43.00	37	8000	0.15	4.00	38.00	0.30	5.00	0.0970	0.8810	0.2368	0.7103
4	4	44.00	43	7000	0.15	4.00	44.00	0.30	5.00	0.0970	0.8810	0.2368	0.7103
4	5	45.00	49	5300	0.15	4.00	50.00	0.30	5.00	0.0970	0.8810	0.2368	0.7103
5	1	51.00	29	9100	0.15	4.00	33.00	0.20	4.50	0.0970	0.8810	0.2368	0.7103
5	2	52.00	33	8200	0.15	4.00	37.00	0.20	4.50	0.0970	0.8810	0.2368	0.7103
5	3	53.00	36	7300	0.15	4.00	40.00	0.20	4.50	0.0970	0.8810	0.2368	0.7103
5	4	54.00	42	6300	0.15	4.00	46.00	0.20	4.50	0.0970	0.8810	0.2368	0.7103
5	5	55.00	48	4800	0.15	4.00	52.00	0.20	4.50	0.0970	0.8810	0.2368	0.7103
6	1	61.00	24	8100	0.15	4.00	24.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
6	2	62.00	29	7700	0.15	4.00	29.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
6	3	63.00	33	6900	0.15	4.00	33.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
6	4	64.00	37	6000	0.15	4.00	37.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
6	5	65.00	44	4600	0.15	4.00	44.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
7	1	71.00	23	7800	0.15	4.00	23.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
7	2	72.00	28	7000	0.15	4.00	28.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
7	3	73.00	32	6200	0.15	4.00	32.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
7	4	74.00	36	5500	0.15	4.00	36.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
7	5	75.00	43	4200	0.15	4.00	43.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
8	1	81.00	22	6000	0.15	4.00	22.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
8	2	82.00	26	5700	0.15	4.00	26.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
8	3	83.00	29	5200	0.15	4.00	29.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
8	4	84.00	34	4500	0.15	4.00	34.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
8	5	85.00	41	3500	0.15	4.00	41.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
9	1	91.00	21	5100	0.15	4.00	21.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
9	2	92.00	25	4600	0.15	4.00	25.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
9	3	93.00	28	4100	0.15	4.00	28.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
9	4	94.00	33	3600	0.15	4.00	33.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
9	5	95.00	40	2800	0.15	4.00	40.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
10	1	101.00	16	5100	0.15	4.00	16.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
10	2	102.00	20	4600	0.15	4.00	20.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
10	3	103.00	23	4100	0.15	4.00	23.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
10	4	104.00	28	3600	0.15	4.00	28.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
10	5	105.00	35	2800	0.15	4.00	35.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
11	1	111.00	29	8100	0.15	4.00	29.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
11	2	112.00	32	7700	0.15	4.00	32.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
11	3	113.00	35	6900	0.15	4.00	35.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
11	4	114.00	40	6000	0.15	4.00	40.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
11	5	115.00	46	4600	0.15	4.00	46.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
12	1	121.00	24	18000	0.15	4.00	24.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103

12	2	122.00	27	18000	0.15	4.00	27.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
12	3	123.00	30	18000	0.15	4.00	30.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
12	4	124.00	35	18000	0.15	4.00	35.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
12	5	125.00	41	18000	0.15	4.00	41.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
13	1	131.00	17	9400	0.15	4.00	17.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
13	2	132.00	21	9000	0.15	4.00	21.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
13	3	133.00	24	8000	0.15	4.00	24.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
13	4	134.00	30	7000	0.15	4.00	30.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
13	5	135.00	36	5300	0.15	4.00	36.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
14	1	141.00	43	28200	0.15	4.00	43.00	0.55	7.00	0.0970	0.8810	0.2368	0.7103
14	2	142.00	45	26300	0.15	4.00	45.00	0.55	7.00	0.0970	0.8810	0.2368	0.7103
14	3	143.00	48	24500	0.15	4.00	48.00	0.55	7.00	0.0970	0.8810	0.2368	0.7103
14	4	144.00	51	22900	0.15	4.00	51.00	0.55	7.00	0.0970	0.8810	0.2368	0.7103
14	5	145.00	54	20400	0.15	4.00	54.00	0.55	7.00	0.0970	0.8810	0.2368	0.7103
0	1	1.00	13	5100	0.15	4.00	13.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
0	2	2.00	17	4600	0.15	4.00	17.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
0	3	3.00	20	4100	0.15	4.00	20.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
0	4	4.00	25	3600	0.15	4.00	25.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
0	5	5.00	32	2800	0.15	4.00	32.00	0.15	4.00	0.0970	0.8810	0.2368	0.7103
15	1	151.00		28200			44.00	0.55	7.00	0.0970	0.8810	0.2368	0.7103
15	2	152.00		26300			44.00	0.55	7.00	0.0970	0.8810	0.2368	0.7103
15	3	153.00		24500			44.00	0.55	7.00	0.0970	0.8810	0.2368	0.7103
15	4	154.00		22900			49.00	0.55	7.00	0.0970	0.8810	0.2368	0.7103
15	5	155.00		20400			51.00	0.55	7.00	0.0970	0.8810	0.2368	0.7103
16	1	161.00		28200			50.00	0.55	7.00	0.0970	0.8810	0.2368	0.7103
16	2	162.00		25100			52.00	0.55	7.00	0.0970	0.8810	0.2368	0.7103
16	3	163.00		22500			55.00	0.55	7.00	0.0970	0.8810	0.2368	0.7103
16	4	164.00		20200			58.00	0.55	7.00	0.0970	0.8810	0.2368	0.7103
16	5	165.00		16700			61.00	0.55	7.00	0.0970	0.8810	0.2368	0.7103

Appendix C: Calypso Regression Output

I-10 Corridor, including Paisano (US 85) and Mesa

TRAFFIC VOLUME REGRESSION WORKSHEET — February 17, 2011

PROJECT: BHW
LIMITS: I10/Mesa thru BOTA to I10/Raynolds and 375/Fonseca
District: El Paso
County: El Paso
CSJ:

ROUTE	10	Mesa	10	10	10	85	85	85	85	10	10	10
LOCATION	N of Mesa	S of 10	S of Mesa	N of Sunland	S of Sunland	S of Sunland	Between Rac	S of McNutt	S of Executiv	S of McNutt	S of Executive	Center
1989	38000	27000	47000	56000	66000	8400	11400	15100	18100	77000	72000	118000
1990	37000	32000	53000	89000	81000	7200	9300	14400	14500	89000	87000	130000
1991	37000	32000	47000	88000	81000	7100	10200	15800	15900	89000	86000	131000
1992	48000	29000	49000	94000	85000	11000	11800	17600	17300	94000	96000	140000
1993	52000	34000	60000	97000	84000	10700	11700	17800	16200	93000	84000	141000
1994	51000	32000	62000	101000	92000	11600	12000	22000	17100	101000	98000	146000
1995	55000	34000	70000	110000	99000	12600	13000	20000	17800	109000	105000	154000
1996	61000	36000	65000	107000	94000	12600	12900	18300	16700	104000	99000	149000
1997	60000	36000	64000	99000	88000	12600	13000	21000	19500	96000	96000	149000
1998	60000	39000	75000	116000	108000	12900	16200	23000	19000	117000	116000	160000
1999	68000	33000	73000	113000	102000	12800	16800	22000	21000	111000	113000	158000
2000	71000	36000	80000	121000	109900	15700	19700	27000	23000	119000	122000	165000
2001	77000	44000	83000	125000	112000	13000	19000	26000	23000	120000	114000	162000
2002	83000	37000	73000	110000	100000	12700	18500	23000	15400	108000	110000	159000
2003	71000	40000	82000	127000	118000	13300	23000	19000	20000	126000	128000	173000
2004	80000	46000	91000	137000	128000	12000	14900	23000	17200	136000	140000	190000
2005	78850	50910	92340	173920	130350	14200	15300	24000	20310	139100	143170	191560
2006	77000	48000	95000	140000	128000	13500	15000	25000	20000	138000	140000	187000
2007	75000	46000	102000	140000	126000	13200	14900	26000	19400	137000	136000	185000
2008	85000	49000	96000	125000	113000	13800	18800	26000	20000	122000	124000	177000
2009	95000	44000	92000	134000	122000	13400	17400	24000	21000	131000	130000	176000
	Regr01	Regr02	Regr03	Regr04	Regr05	Regr06	Regr07	Regr08	Regr09	Regr10	Regr11	Regr12
Low Linear Annual Growth Rate	1.7%	1.2%	1.6%	1.3%	1.2%	0.9%	1.0%	1.1%	0.4%	1.2%	1.3%	1.0%
Forecast Lnr. An. Grwth Rate	2.9% ☑	2.1% ☐	2.7% ☑	2.3% ☑	2.1% ☑	1.8% ☐	2.1% ☐	1.9% ☐	1.0% ☐	2.0% ☑	2.2% ☑	1.7% ☑
High Linear Annual Growth Rate	4.0%	3.0%	3.7%	3.3%	3.0%	2.7%	3.3%	2.8%	1.7%	2.8%	3.0%	2.3%
Estimated Standard Deviation	4909.46	3011.30	4631.56	12774.35	7257.21	1430.86	2473.79	2095.28	1936.65	7264.20	8298.21	7378.00
B (Slope)	2585	1012	2666	3399	2742	267	408	508	216	2741	3056	3149
A (Intercept)	38909	38909	47210	80431	75787	9442	10914	16302	16524	84785	80830	127637
R=	0.956	0.902	0.963	0.855	0.920	0.757	0.715	0.833	0.569	0.920	0.916	0.936
Confidence Interval	+/- 90% CI 1017	+/- 90% CI 423	+/- 90% CI 1043	+/- 90% CI 1496	+/- 90% CI 1122	+/- 90% CI 133	+/- 90% CI 215	+/- 90% CI 230	+/- 90% CI 143	+/- 90% CI 1122	+/- 90% CI 1258	+/- 90% CI 1267
	Avg. of selected Forecast Linear Annual Growth Rates:					2.3%	Avg. of all Forecast Linear Annual Growth Rates:				2.1%	
GR's for Non-Regression vol's only												

PROJECTIONS OF ABOVE TRAFFIC VOLUME DATA TO FORECASTED YEARS

Use last Count Year from above. ☑
Do not use last Count Year from above. ☐
Enter any one of previous count years from above. 2003

Enter Base Year 2008

Pivot Growth Rate at 20 Years from Count Year (most commonly used). ☑
Pivot Growth Rate (GR) at other than 20 Years from Count Year. ☐
Enter years from Count Year for pivoting Growth Rate (e.g. for pivoting growth ten years from Count Year, enter 10) 10

Enter Model Year 2030

Optional Input: SPR Station, Yr
Optional Input: K-Factor
Optional Input: Dir. Dist.
Enter Earliest Variable Year 2025
Enter Latest Variable Year 2035

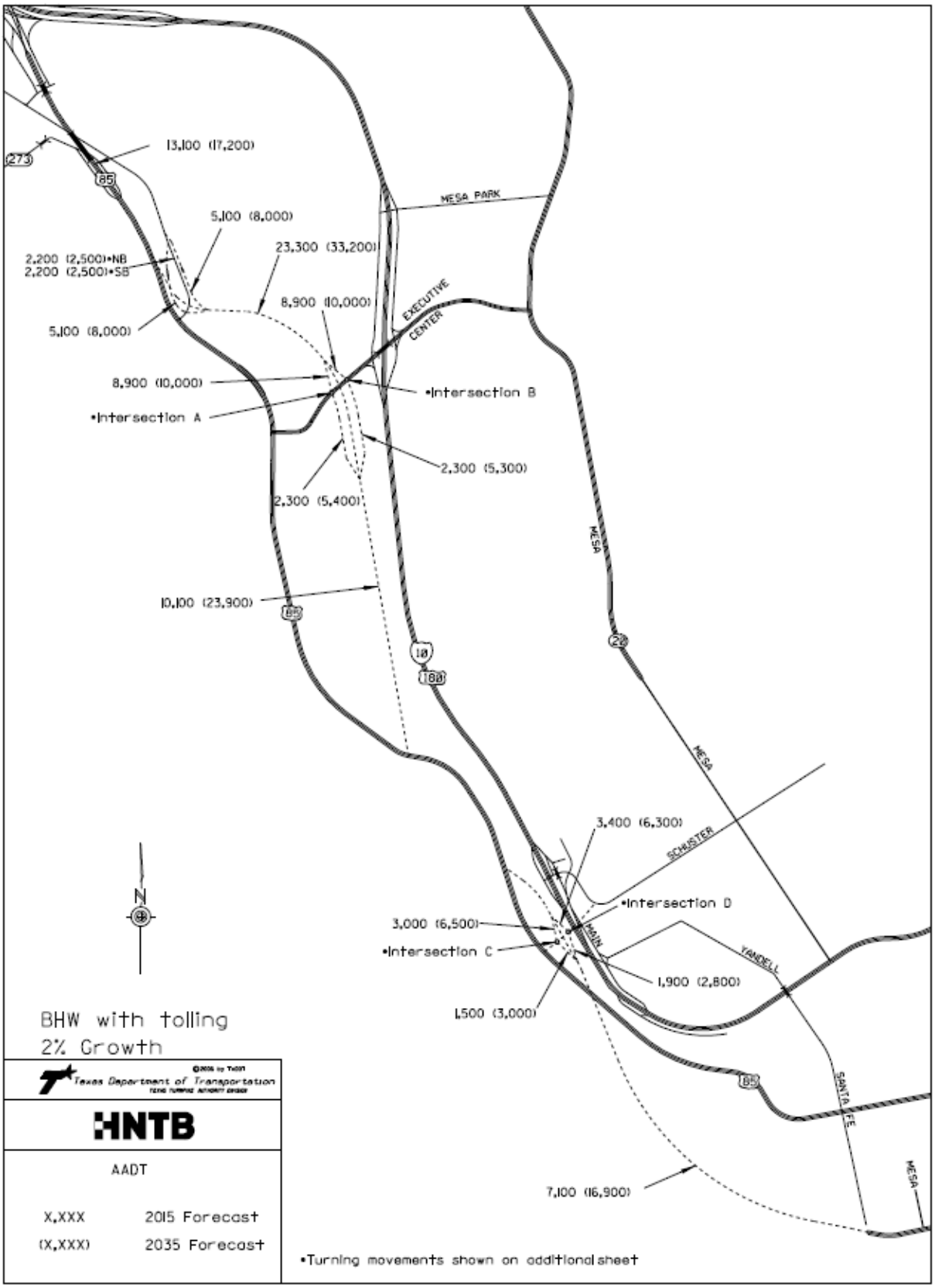
Pre-20/Pivot Yr Growth Rates Selection

Use Relative Low & Non-Regression GR's	○
Use Relative Frcst & Non-Regression GR's	○
Use Relative High & Non-Regression GR's	○
Use Avg. of Selected Low Growth Rates	○ 1.3%
Use Avg. of Selected Forecast Growth Rates	◉ **2.3%**
Use Avg. of Selected High Growth Rates	○ 3.1%
Use Avg. of All Low Growth Rates	○ 1.2%
Use Avg. of All Forecast Growth Rates	○ **2.1%**
Use Avg. of All High Growth Rates	○ 3.0%
Use Highest Forecast Growth Rate	○ 2.9%
Use Lowest Forecast Growth Rate	○ 1.0%
Use Manually Selected Growth Rate	○ 2.0%

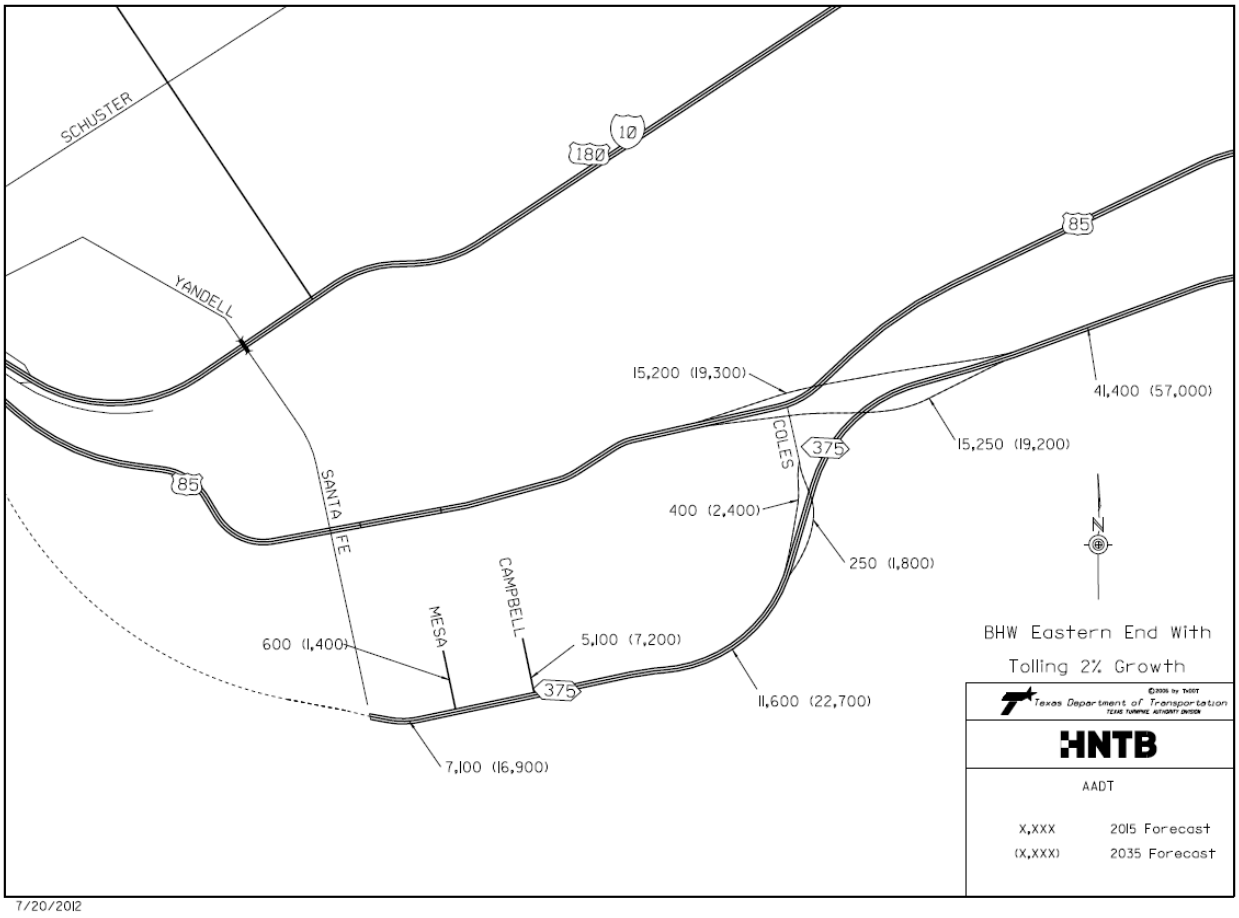
Post-20/Pivot Year Growth Rate Note: if Pre-20/Pivot Yr GR is 2.0% or less, that rate is used in the projections, not the rate below.
Enter Growth Rate (2.0% most common) 2.0%

ROUTE	10	Mesa	10	10	10	85	85	85	85	10	10	10
LOCATION	N of Mesa	S of 10	S of Mesa	N of Sunland	S of Sunland	S of Sunland	Between Rac	S of McNutt	S of Executiv	S of McNutt	S of Executiv	
20/PIVOT YR AN. GROWTH RATE	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%
Count Year - 2009	95000	44000	92000	134000	122000	13400	17400	24000	21000	131000	130000	176000
Base Year - 2008	92800	43000	89900	130900	119200	13100	17000	23400	20500	128000	127000	172000
Ten Year Forecast - 2018	114700	53100	111000	161700	147300	16200	21000	29000	25300	158100	156900	212400
Twenty Year Forecast - 2028	136500	63200	132200	192600	175300	19300	25000	34500	30200	188200	186800	252900
Thirty Year Forecast - 2038	155800	72200	150900	219800	200100	22000	28500	39400	34400	214800	213200	288600
Forty Year Forecast - 2048	174800	81000	169300	246600	224500	24700	32000	44200	38600	241000	239200	323800
GR Pivot Year Forecast - 2029	138700	64200	134300	195600	178100	19600	25400	35000	30700	191300	189800	257000
Earliest Var Yr Frcst - 2026	130000	60200	125900	183300	166900	18300	23800	32800	28700	179200	177800	240800
Latest Var Yr Frcst - 2036	150100	69500	145400	211700	192800	21200	27500	37900	33200	207000	205400	278100
Model Year Forecast - 2030												
Model Traffic Assignment												
Difference of Model Yr Forecast from Model Traffic Assignment												
Above Difference in DDHV												
% Difference of Model Yr Forecast from Model Traffic Assignment												

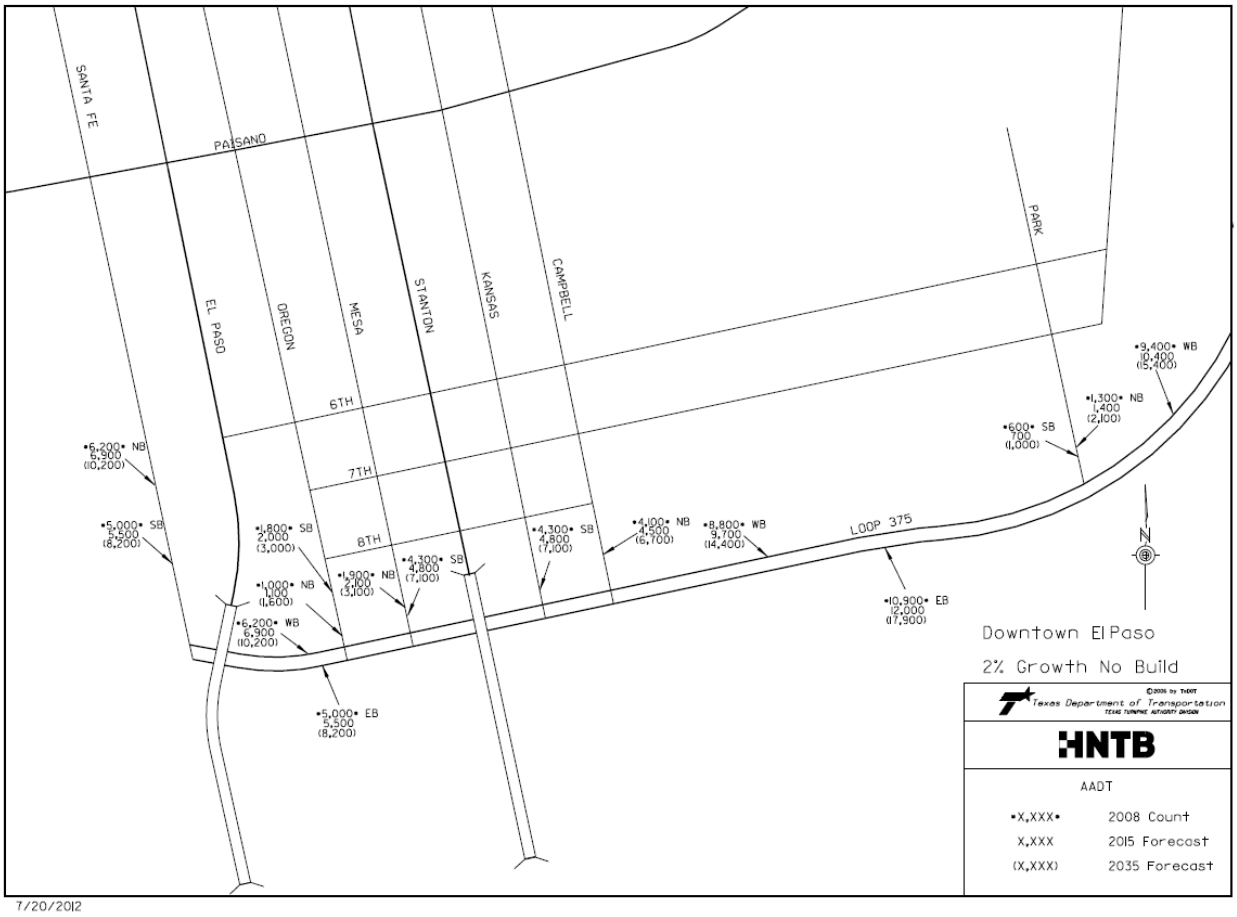
Appendix D: Line Diagram of tolled BHW



Appendix E: Line Diagram of downtown El Paso with tolled BHW



Appendix F: Line Diagram of downtown El Paso under no build scenario



Appendix G: Daily Turning Movements for Intersections A-D from Appendix D